REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Office Action dated March 26, 2008 (U.S. Patent Office Paper No. 20080314). In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

As outlined above, claims 1-2, 6-8, 12-13 and 17-22 stand for consideration in this application, wherein claims 3-5 and 9-11 are being canceled without prejudice or disclaimer, claims 1, 7 and 17 are being amended to more particularly point out and distinctly claim the subject invention, and new claims 18-22 are being submitted for consideration. Support for the above-outlined amendments may be found throughout the disclosure of the invention. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

Formal Objections or Rejections

The Examiner rejected claims 1-13 and 17 under 35 U.S.C. §112, second paragraph, as being indefinite. Applicants have revised the claims in accordance with the Examiner's requirements. As such, this formal rejection against the claims is hereby rendered moot.

Prior Art Rejections

The Examiner rejected claims 1-12 and 17 under 35 U.S.C. §103(a) as being unpatentable over Barna et al. (US Patent No. 6,611,235) in view of Onaka et al. (US Patent No. 6,600,449), and rejected claim 13 further in view of Nagumo et al. (US Publication No. 2002/0163470). Applicants have reviewed the above-outlined rejections, and hereby respectfully traverse.

The present invention as now recited in claim 1 is directed to an antenna comprising: a ground conductor having a ground potential; a single feeding point whose one end is formed by a part of the ground conductor; and a plurality of transmission lines to which RF power supplied to the feeding point is input, for radiating electromagnetic waves of a plurality of frequencies into space, wherein the plurality of transmission lines include a transmission line for radiating electromagnetic waves of the plurality of frequencies

commonly into space. Impedance matching is performed at the feeding point with respect to the plurality of frequencies. When the plurality of frequencies are composed of n frequencies of first, second, third and fourth to n-th frequencies, where n is a positive integer of two or more, the total length of the plurality of transmission lines is shorter than the sum of a quarter wavelength of an electromagnetic wave of the first frequency and half wavelengths of electromagnetic waves of the second, third and fourth to n-th frequencies, the second, third and fourth to n-th frequencies being higher than the first frequency.

As set forth in claim 7, the present invention is directed to an antenna comprising: a ground conductor having aground potential; a single feeding point whose one end is formed by a part of the ground conductor; and a plurality of transmission lines to which RF power supplied to the feeding point is input, for radiating electromagnetic waves of a plurality of frequencies into space, wherein the plurality of transmission lines include a transmission line for radiating electromagnetic waves of the plurality of frequencies commonly into space. When the plurality of frequencies are composed of two frequencies of first and second frequencies, the plurality of transmission lines include a first transmission line whose one end is connected to the feeding point and whose other end is connected to a first branching point, and a second transmission line connected to the first branching point. Respective lengths of the plurality of transmission lines are set so that impedance matching is performed at the feeding point with respect to the plurality of frequencies, and the total length of the plurality of transmission lines is shorter than the sum of a quarter wavelength of an electromagnetic wave of the first frequency and a half wavelength of an electromagnetic wave of the second frequency, the second frequency being higher than the first frequency.

Further, the present invention as recited in claim 17 is directed to a portable wireless terminal comprising an antenna incorporated therein, the antenna comprising: a ground conductor having a ground potential; a single feeding point whose one end is formed by a part of the ground conductor and a plurality of transmission lines to which RF power supplied to the feeding point is input, for radiating electromagnetic waves of a plurality of frequencies into space, wherein the plurality of transmission lines include a transmission line for radiating electromagnetic waves of the plurality of frequencies commonly into space. When the plurality of frequencies are composed of two frequencies of first and second frequencies, the plurality of transmission lines include a first transmission line whose one end is connected to the feeding point and whose other end is connected to a first branching point, and a second transmission line connected to the first branching point. Respective lengths of the plurality of

transmission lines are set so that impedance matching is performed at the feeding point with respect to the plurality of frequencies, and the total length of the plurality of transmission lines is shorter than the sum of a quarter wavelength of an electromagnetic wave of the first frequency and a half wavelength of an electromagnetic wave of the second frequency, the second frequency being higher than the first frequency.

Among the main structural and operational features of the present invention, as described in lines 20-24 of page 8 of the English specification, the basic operating principle of the antenna according to the present invention is that an electromagnetic wave is radiated into free space in a non-local manner in each of the frequency bandwidths in which the antenna is to be operated.

Based on this configuration, as described on page 10, line 15 to page 11, line 3, in the present invention, electromagnetic waves are radiated from the transmission lines constituting the antenna at respective frequencies in a non-local manner, whereby unlike the multi-mode antenna of the prior art, a specific transmission line contributes to radiation commonly with respect to plural frequencies, and the presence of this common portion contributes positively to a reduction in the overall length or dimension of the current pathway of the conductor portion of the multi-mode antenna contributing to the radiation. Accordingly, due to the short overall length or dimensions of the current pathway as compared with that of the multi-mode antenna of the prior art, the bandwidth can be expanded in the antenna according to the present invention.

In contrast to the present invention, Barna '235 discloses an antenna wherein an electromagnetic wave is radiated into free space in a non-local manner in each of the frequency bandwidths in which the antenna is to be operated. However, Barna neither discloses nor suggests the relation between the total length of transmission lines used in the antenna and frequency (wavelength) of a radiated electromagnetic wave, as now recited in the claims. Thus, the present invention as a whole is distinguishable and thereby allowable over Barna '235 by itself.

The secondary reference of Onaka '449 discloses in column 4, lines 36-57 an antenna that radiates electromagnetic waves of plural frequencies, but whose operating principle differs substantially from that of the present invention. Since each radiating element contributes to electromagnetic wave radiation individually, an electromagnetic wave is radiated into free space in a local manner in each of the frequency bandwidths in which the antenna is to be operated. Thus, the basic operating principle of Onaka '449 differs not only

from the present invention, but also from that of Barna '235. Applicants will contend that one of skill in the art would not combine these references as these references would contradict one another. It is a well known principle that a rejection based on prior art references that contradict or teach away from each other is improper. (*It is well-settled that the mere fact that the prior art can be modified should not have made the modification obvious unless the prior art suggested the desirability of the modification, and that a modification which would render the prior art apparatus inoperable for its intended purpose does not establish a prima facie case of obviousness.*) *In re Gordon*, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984) (citing *In re Imperato*, 179 U.S.P.Q. 730, 732 (CCPA 1973) and *In re Schulpen*, 157 U.S.P.Q. 52, 55 (CCPA 1968); *[w]here the prior art teaches away from the claimed invention, it cannot render the claimed invention obvious. Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 230 U.S.P.Q. 416, 420 (Fed. Cir. 1986); *In re Gordon*, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984)).

Rather, Applicants will submit that, in this case, the Examiner appears to be using hindsight knowledge of the claimed invention to read elements of the claimed invention into the prior art cited without any clear showing that those elements even exist in the cited prior art. It is also well established that the Examiner is not allowed to use knowledge or hindsight gleaned from the disclosure of the present invention as a guide to support the rejection. *Panduit Corp. v. Dennison Mfg. Co.*, 227 USPQ 337, 344 (Fed. Cir. 1985). See *Para-Ordinance Mfg, Inc. v. SGS Importers Intl.*, Inc., 73 F.3d 1085, 37 USPQ2d 1237 (Fed. Cir. 1995) ("*Obviousness may not be established using hindsight or in view of the teachings or suggestions of the inventor.*").

Therefore, neither Barna '235 nor Onaka '449 discloses or suggests an antenna in which an electromagnetic wave is radiated into free space in a non-local manner in each of the frequency bandwidths in which the antenna is to be operated and relation between the total length of transmission lines used in the antenna and frequency (wavelength) of a radiated electromagnetic waves. In other words, using claim 1 as an example, these references, either individually or even in combination, do not show or suggest any structure or operation for the combination of a ground conductor having a ground potential; a single feeding point whose one end is formed by a part of the ground conductor; and a plurality of transmission lines to which RF power supplied to the feeding point is input, for radiating electromagnetic waves of a plurality of frequencies into space, wherein the plurality of transmission lines include a transmission line for radiating electromagnetic waves of the

plurality of frequencies commonly into space, impedance matching is performed at the feeding point with respect to the plurality of frequencies, and when the plurality of frequencies are composed of n frequencies of first, second, third and fourth to n-th frequencies, where n is a positive integer of two or more, the total length of the plurality of transmission lines is shorter than the sum of a quarter wavelength of an electromagnetic wave of the first frequency and half wavelengths of electromagnetic waves of the second, third and fourth to n-th frequencies, the second, third and fourth to n-th frequencies being higher than the first frequency. As such, these references cannot anticipate or render obvious each and every feature of the present invention as claimed.

With respect to the secondary reference of Nagumo '470, this reference was only cited for showing features in the dependent claims. Nagumo '470 falls far short of providing any disclosure, teaching or suggestion to make up for the deficiencies in Barna '235 nor Onaka '449, such that their combination could render each and every feature of the present invention obvious to one of skill in the art. Rather, even if these references were combined, they would still fail to show or suggest any structure or operation for an antenna in which an electromagnetic wave is radiated into free space in a non-local manner in each of the frequency bandwidths in which the antenna is to be operated and relation between the total length of transmission lines used in the antenna and frequency (wavelength) of a radiated electromagnetic waves, as recited in the claims. Thus, the present invention as a whole is distinguishable and thereby allowable over the prior art of record.

Conclusion

In view of all the above, Applicants respectfully submit that certain clear and distinct differences as discussed exist between the present invention as now claimed and the prior art references upon which the rejections in the Office Action rely. These differences are more than sufficient that the present invention as now claimed would not have been anticipated nor rendered obvious given the prior art. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application as amended is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicants' undersigned representative at the address and phone number indicated below.

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